

MISCELLANEOUS NOTES ON SPHAGNUM—10

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NEW SPECIES

Sphagnum [sect. *Sphagnum*] **amoenoides** Crum, sp. nov.—TYPE: BRAZIL. São Paulo: Serra da Mantiqueira, Pindamonhangaba, Pico do Itapeva, ca. 6 km SE of Campos do Jordão, 22°46'S, 45°35'W, ca. 2000 m, 18 Oct 1994, *Buck 26422* (holotype: MICH!; isotype: NY!). Fig. 1.

Plantae usque ad 4 cm altae. Cellulae epidermidis caulinae sine fibrillis et poris. Folia caulina 1.8 mm longa, anguste oblongo-ovata, apice cucullata, margine laterali sulco resorpto; cellulae hyalinae usque ad basim fibrillosae, dorso poris parvis annulatis ad angulos instructae, superficie interiore poris nullis. Fasciculi ramorum ramis tribus (1 pendent). Folia ramulina madida quinquefaria, 1.5–1.8 mm longa, oblongo-lanceolata, apice cucullata; cellulae hyalinae poris et fibrillis ut in foliis caulinis; cellulae chlorophylliferae in sectione transversali orciformes utroque latere folii parietibus incrassatis brunneis liberae.

Plants small and slender (up to 4 cm high), pale green tinged with brown. Stem cortex efibrillose, without pores; wood cylinder brown. Stem leaves 1.8 mm long, narrowly oblong-ovate, cucullate-concave, bordered by a resorption furrow; hyaline cells fibrillose nearly to the base, on the outer surface with small, strongly ringed pores at angles (some of them in 3's), on the inner surface without pores. Branches in fascicles of 3 (1 ± pendent); cortex efibrillose. Branch leaves 5-ranked when moist, 1.5–1.8 mm long, oblong-lanceolate; hyaline cells as in stem leaves; green cells barrel-shaped, exposed on both surfaces with a thickened brown wall, the hyaline cells convex on both surfaces.

The plants are small, with short branches and spreading leaves. They show some similarity to *S. amoenum* Warnst. but have stems with a brown wood cylinder and larger stem and branch leaves of different porosity. Both stem and branch leaves have small, ringed pores on the outer surface but none on the inner, and the hyaline cells of stem leaves are fibrillose nearly throughout. *Sphagnum amoenum* has more differentiated leaves, those of the stems efibrillose, with pores none or few on the outer surface and small to large membrane gaps on the inner, and the branch leaves have numerous pseudopores on the outer surfaces and both pseudopores and membrane pleats on the inner.

Sphagnum [sect. *Sphagnum*] **atroligneum** Crum, sp. nov.—TYPE: BRAZIL. Paraná: Bergland bei Lapa, 70 km SW von Curitiba, sickerfeuchte Sandsteinfelsen und Quellmulden bei der Gruta do Monge, ca. 25°47'S, 49°42'W, 590–1000 mm NN, 17–18 Dec 1991, *Schäfer-Verwimp & Verwimp 15214* (holotype: MICH!; isotype: Schäfer-Verwimp!). Fig. 2.

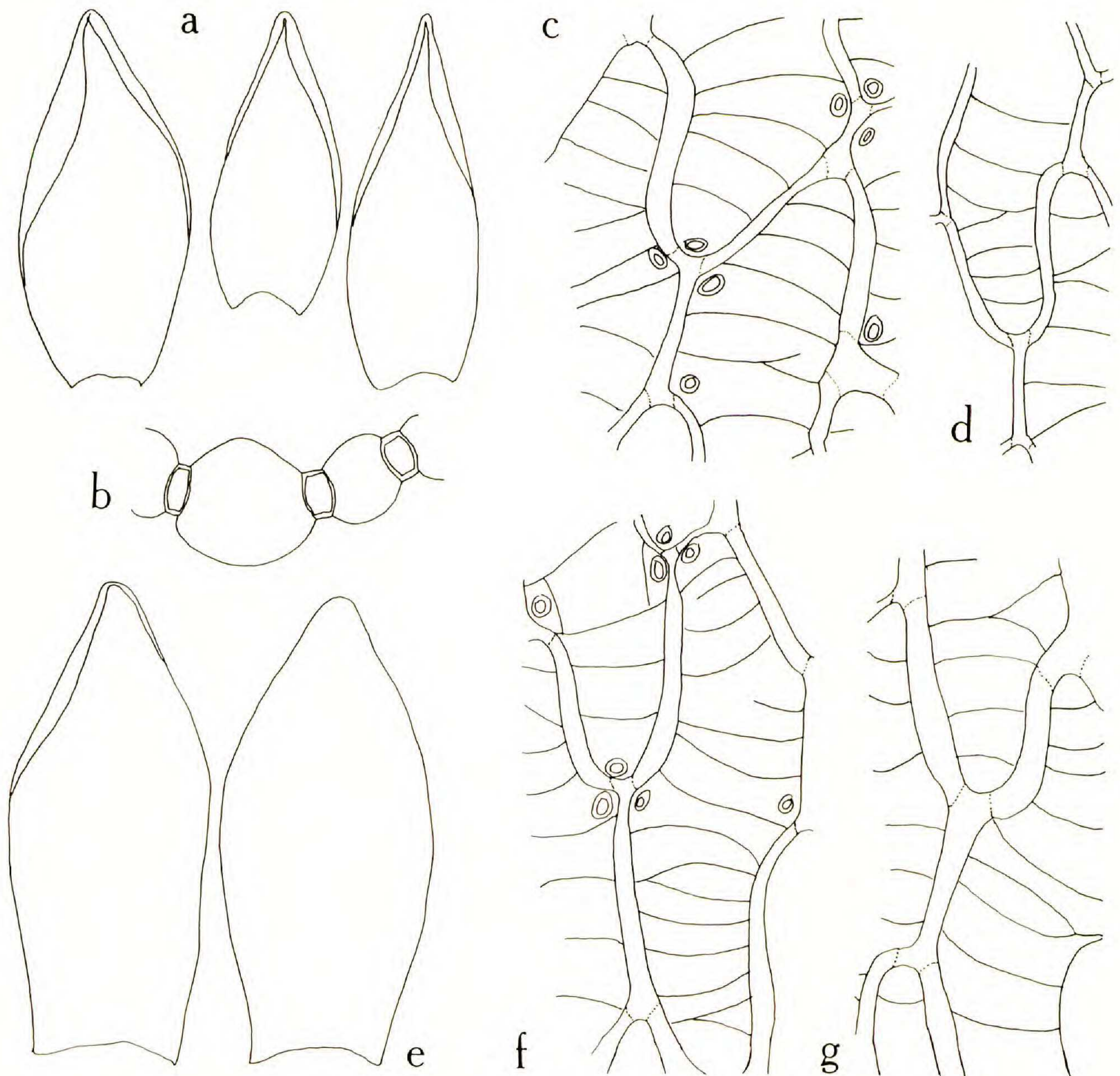


FIG. 1. *Sphagnum amoenoides*. a. Branch leaves, $\times 24$. b. Portion of branch leaf in section, $\times 390$. c. Upper cells of branch leaf, outer surface, $\times 390$. d. Upper cells of branch leaf, inner surface, $\times 390$. e. Stem leaves, $\times 24$. f. Upper cells of stem leaf, outer surface, $\times 390$. g. Upper cells of stem leaf, inner surface, $\times 390$.

Plantae pusillae, fuscae. Caules plus minusve subnigri; cellulae epidermidis delicate fibrillosae, uniporosae; cylindrus lignosus brunneo-niger. Folia caulina 1.8–1.9 mm longa, concava, lingulata, apice fimbriatula, inferne sulco resorpto marginata; cellulae hyalinae omnino fibrillosae, dorso 2–5 poris rotundo-ellipticis, superficie interiore poris 1–2 magnis, rotundis, saepe etiam margine pseudoporis commissuralis. Fasciculi ramorum ramis 2–3 (1 pendenti); cellulae epidermidis fibrillosae, uniporosae. Folia ramulina 1.8–2 mm longa, oblongo-ovata, cucullata, dorso poris magnis ad angulos cellularum, interiore 0–3 poris parvis ad angulos et commissuras dispositis; cellulae chlorophylliferae in sectione transversali orificiformes, utroque latere foliorum liberae, superficie exteriori plus minusve latius crassiusculae.

Plants small, brown. Stems very dark, even black; cortex (2–) 3 (–4)-layered, delicately fibrillose, uniporose; wood cylinder blackish brown. Stem leaves 1.8–1.9 mm long, lingulate, bordered by a resorption furrow below, somewhat fringed at the broad apex, concave, fibrillose nearly to the base, on the outer surface with 2–5 moderately large, ringed, elliptic or rounded-elliptic pores, in 3's at adjacent angles, on the inner surface many cells with 1 or sometimes 2 large, round pores,

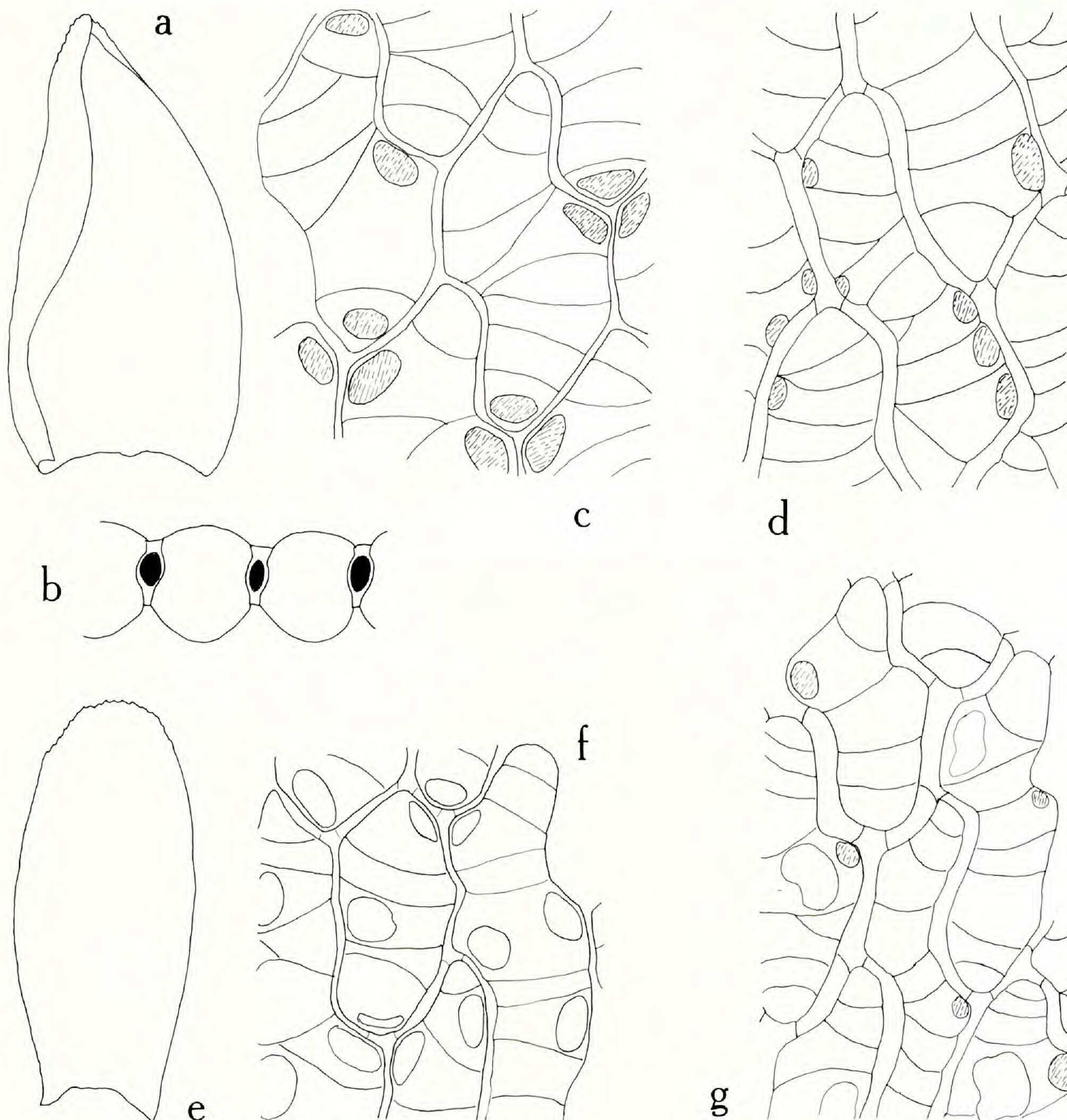


FIG. 2. *Sphagnum atroligneum*. a. Branch leaves, $\times 24$. b. Portion of branch leaf in section, $\times 390$. c. Upper cells of branch leaf, outer surface, $\times 390$. d. Upper cells of branch leaf, inner surface, $\times 390$. e. Stem leaves, $\times 24$. f. Upper cells of stem leaf, outer surface, $\times 390$. g. Upper cells of stem leaf, inner surface, $\times 390$.

often with a few small, ringed, elliptic pseudopores as well. Branches in fascicles of 2 or 3 (2 spreading, 1 pendent); cortex delicately fibrillose, uniporose. Branch leaves 1.8–2 mm long, oblong-ovate, cucullate-concave, on the outer surface with large, ringed pseudopores in 3's at adjacent corners, on the inner surface with 0–3 small, ringed pseudopores at commissures and side angles and sometimes 1 or few round pores at angles; green cells barrel-shaped, narrowly exposed on both surfaces because of thickened cell ends (but rather more broadly so on the outer surface).

The stem and branch leaves are quite similar, except that the stem leaves have a fair number of pores (2–5) at side angles and commissures in addition to those in 3's at adjacent corners on the outer surface and 1–2 large round pores on the inner, while the branch leaves have large, ringed pseudopores in 3's at adjacent corners on the outer surface and fewer smaller, ringed pseudopores on the inner. The dark stems and their blackish wood cylinders are interesting.

Sphagnum [sect. *Sphagnum*] **billbuckii** Crum, sp. nov.—TYPE: BRAZIL. Minas Gerais: Serra do Espinhaço, Mpio. Santa Bárbara, Parque Natural do Caraça, along trail from Santuário do Carapuça to Pico da Carapuça, 20°02'S, 43°30'W, alternately moist and dry sandstone, 1300-1460 m, 22 Oct 1994, Wm. R. Buck 26642 (holotype: MICH!; isotype: NY!). Fig. 3.

Plantae minutae, 1–2 cm altae, pallide virides. Cellulae epidermidis caulinae efibrillosae, porosae; cylindrus lignosus pallide fulvus. Folia caulina 1.5–1.8 mm longa, ovata, cucullata, margine sulco resorpto; cellulae hyalinae omnino fibrillosae, superficie exteriori poris plus minusve parvis ad angulos, interiori poris magnis ad margines foliorum dispositis. Fasciculi ramorum ramis 2–3 (1–2 pendentibus), cellulis epidermidis ramorum patentium efibrillosis, pendentium distincte fibrillosis. Folia ramulina 2 mm longa, ovato-acuminata, apice patentia; cellulae hyalinae ut in foliis caulinis; cellulae chlorophylliferae in sectione transversali anguste triangulares, latere foliorum interiori liberae.

Plants very small and slender, 1–2 cm high, pale green. Cortical cells of stems efibrillose at the surface, porose; wood cylinder pale brown. Stem leaves 1.5–1.8 mm long, ovate, cucullate-concave, bordered by a resorption furrow; hyaline cells fibrillose throughout, on the outer surface with rather small, elliptic pores at angles (in 3's at adjacent corners), on the inner surface with large, round pores toward the leaf margins, otherwise very few or none. Branches in fascicles of 2–3 (1–2 very slender and pendent), the spreading branches tapered; cortical cells of spreading branches efibrillose at the surface, those of the pendent branches distinctly fibrillose, porose. Branch leaves 2 mm long, ovate-acuminate, spreading at the tips; hyaline cells as in stem leaves; green cells very narrowly triangular, somewhat exposed on the inner surface, the hyaline cells bulging on both surfaces, with side walls in well-formed leaves very minutely and faintly papillose.

The plants are small and have tapered branches, spreading leaf tips, isophyllous stem and branch leaves, sides of hyaline cells very minutely papillose (at least in well-formed leaves), and green cells narrowly triangular with exposure on the inner surface. The species is somewhat like *S. brevirameum* Hampe, except for smaller size, leaves larger and isophyllous (with resorption furrows in both stem and branch leaves), fewer branches per fascicle, and green cells not central and included.

Sphagnum [sect. *Cuspidata*] **subditivum** Crum, sp. nov.—TYPE: NEW ZEALAND. Canterbury: emergent at edge of tarn in hollow among *Sphagnum australe*, moist, subalpine *Notofagus solandri* forest, 900 m, S bank of upper reaches of Bealey River near Margaret's Tarn (Bealey Glacier Track), Arthur's Pass National Park, 2 Dec 1986, A. Fife (with C. D. Meurk) 8011 (holotype: MICH!; isotype: CHR!). Fig. 4.

Plantae plus minusve graciles, laete viridi-luteae. Epidermis caulina ex stratis 2 composita; cylindrus lignosus pallide luteus. Folia caulina 1.4–1.7 mm longa, oblongo-ovata vel elliptica, superne concava, acuta, anguste limbata, limbo deorsum non dilatato; cellulae hyalinae fibrillosae ad folii basin, dorso apice pseudoporis annulatis et poris veris non annulatis in seriebus commissuralibus brevibus dispositis, superficie interiori poris magnis rotundis non annulatis pluribus. Folia ramulina ca. 1.7 mm longa, ovato-lanceolata; cellulae hyalinae dorso pseudoporis annulatis et poris veris non annulatis in seriebus discontinuis ad commissuras

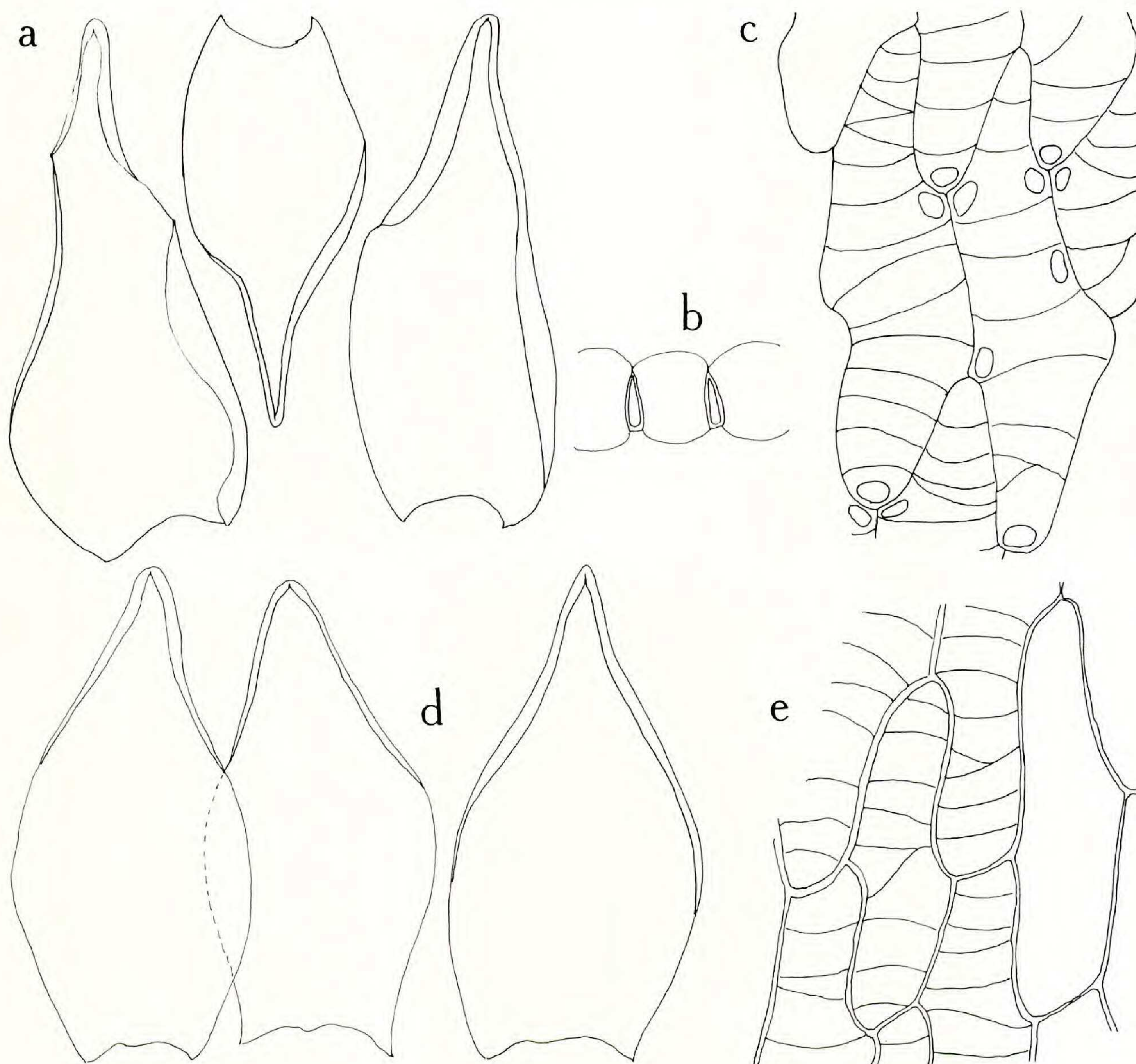


FIG. 3. *Sphagnum billbuckii*. a. Branch leaves, $\times 24$. b. Portion of branch leaf in section, $\times 390$. c. Upper cells of branch leaf, outer surface, $\times 390$. d. Stem leaves, $\times 24$. e. Upper cells of stem leaf, outer surface, $\times 390$.

dispositis, superficie interiore poris magnis rotundis pluribus in seriebus duobus; cellulae chlorophylliferae in sectione transversali triangulatae, utroque latere folii liberae, cum pariete longiore superficie exteriori sitae.

Relatively slender plants in loose, bright, yellow-green mats. Stem cortex well differentiated in 2 layers, without pores; wood cylinder light yellow. Stem leaves 1.4–1.7 mm long, oblong-elliptic to oblong-ovate, gradually narrowed to a slightly concave, acute apex, narrowly bordered; hyaline cells fibrillose throughout, on the outer surface near the apex undivided, with numerous ringed, elliptic pseudopores in discontinuous commissural rows and a scattering of small, round, thin-margined pores, also at commissures, toward the leaf middle occasionally 2-divided, without pores or pseudopores or occasionally with a small, ringed pseudopore at cell angles, on the inner surface with numerous well-spaced, large, round, thin-margined pores in 2 rows. Branches in crowded fascicles of 4 (3 stouter and \pm deflexed, 1 slender and pendent); retort cells with inconspicuous necks. Branch leaves about as long as stem leaves, flattened out and slightly undulate-margined when dry, distinctly concave when moist, ovate-lanceolate, narrowly bordered, often somewhat serrulate toward the apex; hyaline cells on the outer surface with

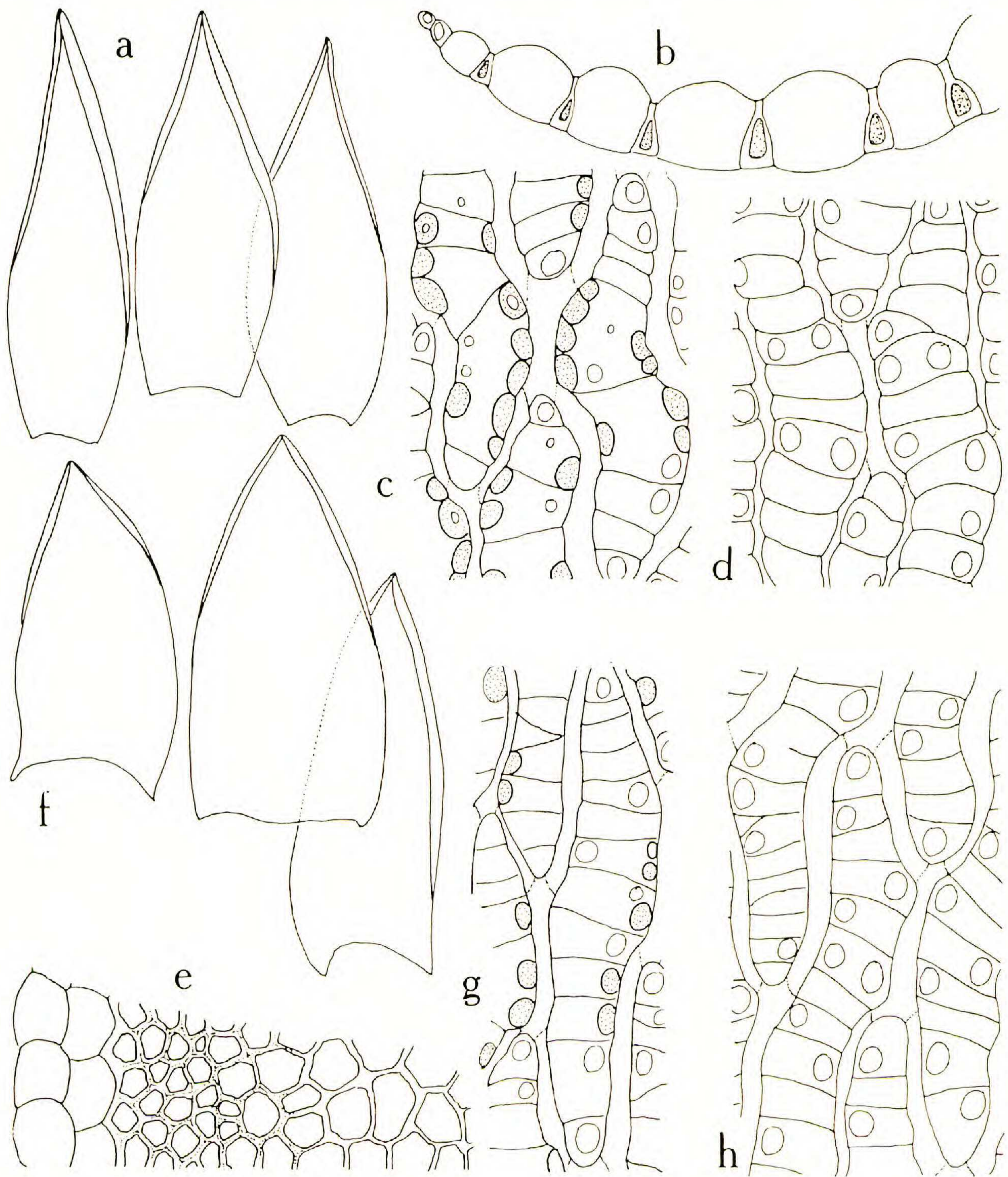


FIG. 4. *Sphagnum subditivum*. a. Branch leaves, $\times 24$. b. Portion of branch leaf in section, $\times 390$. c. Upper cells of branch leaf, outer surface, $\times 390$. d. Upper cells of branch leaf, inner surface, $\times 390$. e. Portion of stem in section, $\times 390$. f. Stem leaves, $\times 24$. g. Upper cells of stem leaf, outer surface, $\times 390$. h. Upper cells of stem leaf, inner surface, $\times 390$.

many ringed, elliptic pseudopores and a scattered few round, thin-margined pores in rather short commissural rows, often between well-spaced fibrils, also with a very few tiny, round, thin-margined pores in a more median position, on the inner surface with many well-spaced, large, round, thin-margined pores near the commissures; green cells in section triangular, the lumen submedian in position, broadly exposed on the outer surface and variously exposed by wall thickening on the inner, the hyaline cells bulging on the inner surface, plane on the outer.

The plants are curiously bright and greenish yellow, with branches crowded and deflexed. The specific epithet, signifying false, was chosen because of a superficial resemblance to section *Subsecunda*. As commonly seen in the section *Cuspi-*

data, the leaves are flattened out and somewhat wavy-margined when dry. The well-marked cortex of the stem suggests that the plants grew in moist hollows but not normally submerged. The arrangement of ringed pseudopores and non-ringed pores in discontinuous commissural rows on the outer surface of the hyaline cells of branch leaves (and the apical cells of stem leaves) are unusual in the *Cuspidata*, but the large, round, thin-margined pores on the inner surface and triangular green cells with broader exposure on the outer give evidence of a relationship there.

Sphagnum [sect. *Subsecunda*] **bocainense** Crum, sp. nov.—TYPE: BRAZIL. São Paulo: Serra da Bocaina bei São José do Barreiro, an quelligem Hang an der Strasse bei “Shangra-lá,” ca. 22°47'S, 44°38'W, 1500 m, 16 Apr 1988, Schäfer-Verwimp & Verwimp 9588 (holotype: MICH!). Fig. 5.

Plantae 7–8 cm altae, pallide virides vel aurantiacae. Epidermis caulina strato uno, sine poris; cylindrus lignosus pallide fulvus. Folia caulina 1.1 mm longa, oblongo-ovata, concavo-obtusa; cellulae hyalinae fere usque ad basim fibrillosae, interdum 1-septatae, superfice exteriori poris valde annulatis, permultis in seriebus ad commissuras dispositis, interiore poris multis vel margine paucis. Fasciculi ramorum ramis duobus, brevibus. Folia ramulina 1 mm longa, ovato-lanceolata; cellulae hyalinae superfice exteriori poris valde annulatis seriebus commissuralibus continuis, interiore poris vel pseudoporis paucis vel nullis; cellulae chlorophylliferae in sectione transversali orciformes vel triangulo-trapezoideae, pariete exteriori longiore.

Plants 7–8 cm high, light green or tinged with orange brown. Epidermis of the stem in 1 layer, without pores; wood cylinder pale yellowish brown. Stem leaves oblong-ovate, concave-obtuse, 1.1 mm long; hyaline cells fibrillose nearly to the base, not or sometimes 1-divided, on the outer surface with strongly ringed, elliptic pores in continuous commissural rows, on the inner surface with pores none or occasional, more numerous toward the margins. Branches short, in fascicles of 2 (both spreading, 1 slightly smaller and somewhat decurved). Branch leaves 1 mm long, ovate-lanceolate; hyaline cells fibrillose, on the outer surface with heavily ringed, elliptic pores in continuous commissural rows, on the inner surface with elliptic pores or pseudopores few or none; green cells in section barrel-shaped to triangular-trapezoidal, more broadly exposed on the inner surface, the hyaline cells convex on both surfaces but more strongly so on the outer.

The plants are tinged with a soft shade of orange brown. The branches are in fascicles of two, both spreading; the stem and branch leaves are similar in structure, having an abundance of strongly ringed pores on the outer surface but few or none on the inner, and green cells are more broadly exposed on the inner face.

Sphagnum [sect. *Subsecunda*] **laxiramosum** Crum, sp. nov.—TYPE: BRAZIL. Mato Grosso: Chapada dos Guimarães NE Cuiabá, Schluchtwald beim Cachoeirinha, an sickerfeuchter Felswand, 600 m NN, 15°28'S, 55°49'W, 4 Jul 1987, Schäfer-Verwimp & Verwimp 8591 (holotype: MICH!). Fig. 6.

Plantae tenues, usque ad 10 cm altae, capitulo nullo sed apice aliquantum bulboso-geminato. Cellulae epidermidis strato uno, sine poris; cylindrus lignosus luteo-aurantiacus. Folia caulina 1 mm longa, ovata, cucullata; cellulae hyalinae ad basim fibrillosae, non septatae, superfice exteriori poris 7–8, non annulatis, ad

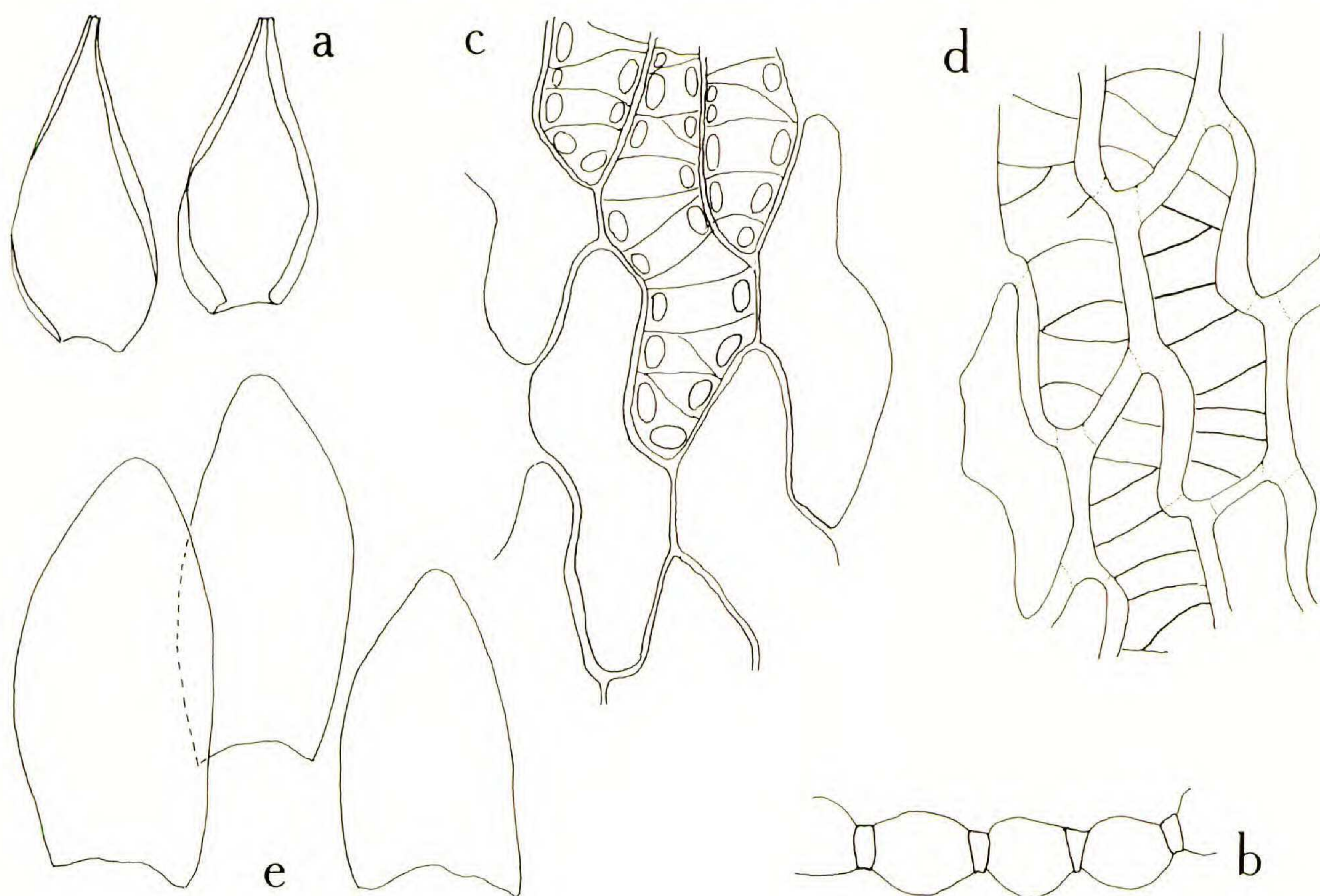


FIG. 5. *Sphagnum bocainense*. a. Branch leaves, $\times 24$. b. Portion of branch leaf in section, $\times 390$. c. Upper cells of branch leaf, outer surface, $\times 390$. d. Upper cells of branch leaf, inner surface, $\times 390$. e. Stem leaves, $\times 24$.

commissuras dispersis, interiore poris annulatis in seriebus commissuralibus continuis. Rami fere solitarii sed interdum 2 vel 3 (1 pendants). Folia ramulina 1–1.1 mm longa, ovato-lanceolata, acuminata; cellulae hyalinae superficiei exterioris poris multis parvis annulatis in seriebus commissuralibus discontinuis, superficiei interiore poris parvis, annulatis, in seriebus commissuralibus discontinuis; cellulae chlorophylliferae in sectione transversali lenticulares, utroque latere foliorum anguste liberae.

Slender plants in loose tufts as much as 10 cm high, without a capitulum but ending in a prominent terminal bud. Epidermal cells of stems in 1 layer, without pores; wood cylinder orange-yellow. Stem leaves 1 mm long, ovate, concave (similar to branch leaves), rounded-cucullate at the apex; hyaline cells fibrillose throughout, not divided, on the outer surface with 7–8 thin-margined pores scattered along the commissures, on the inner surface with ringed, elliptic pores in continuous commissural rows. Branches mostly single, laxly foliate (but occasionally 2 or rarely 3, with 1 short, weak pendent branch. Branch leaves 1–1.1 mm long, ovate-lanceolate, acuminate; hyaline cells on the outer surface with many small, ringed or thin-margined, elliptic pores in discontinuous commissural rows, on the inner surface with pores small, ringed, and rounded-elliptic in nearly continuous commissural rows; green cells in section lenticular, very narrowly and equally exposed on both surfaces, the hyaline cells somewhat convex on both surfaces.

The plants have well-spaced, laxly foliate branches that are mostly single, very similar stem and branch leaves with ringed commissural rows on the inner surface but rather few and often unringed on the outer, and green cells lenticular in section. *Sphagnum delamboyense*, which was collected at the same locality has stems with a dark red-brown wood cylinder, stem leaves triangular with fewer

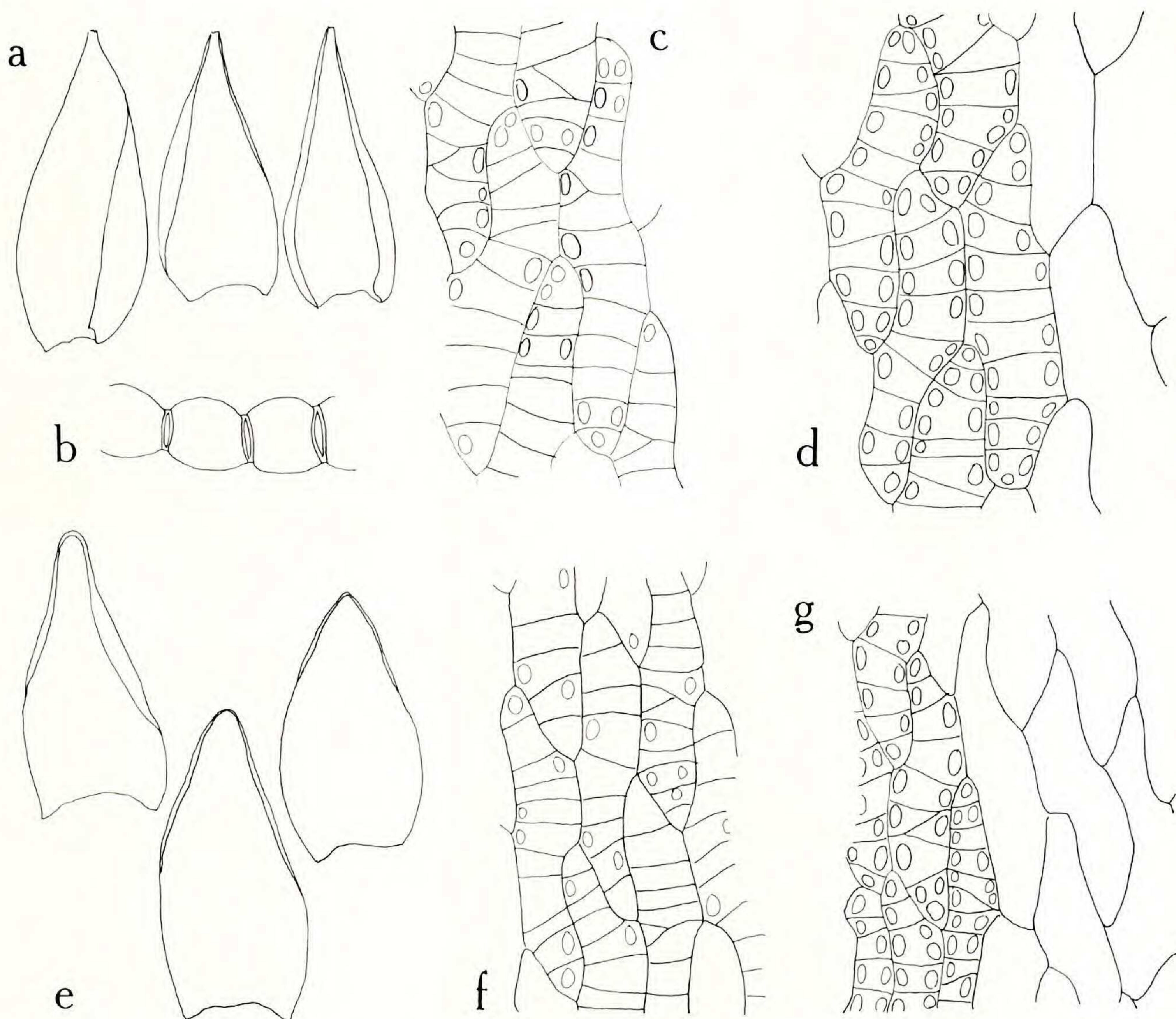


FIG. 6. *Sphagnum laxiramosum*. a. Branch leaves, $\times 24$. b. Portion of branch leaf in section, $\times 390$. c. Upper cells of branch leaf, outer surface, $\times 390$. d. Upper cells of branch leaf, inner surface, $\times 390$. e. Stem leaves, $\times 24$. f. Upper cells of stem leaf, outer surface, $\times 390$. g. Upper cells of stem leaf, inner surface, $\times 390$.

pores on both surfaces, those on the inner surface more or less irregularly arranged, branches in threes, branch leaves larger and ovate with pores in nearly continuous commissural rows on both surfaces, and green cells barrel-shaped.

***Sphagnum* [sect. *Subsecunda*] *rio-negrense* Crum, sp. nov.**—TYPE: COLOMBIA. Cundinamarca: Páramo de Palacio, cavceras Río Negro, 3375 m, 22 May 1972, A. M. Cleef 4001 (holotype: NY!). Fig. 7.

Plantae tumidae, ca 6 cm altae, brunneae vel fulvae. Caules simplices, valde tenues; cellulae epidermidis 1–2-stratosae, saepe porosae; cylindrus lignosus fuscus vel rufo-brunneus. Folia 2 mm longa, ovato-elliptica, profunde concava; cellulae hyalinae non septatae, superficie exteriori fibrillis vestigialibus, poris parvis, annulatis, in seriebus commissuralibus continuis, interiore pseudoporis fibrillosis annulatis paucis vel numerosis, in seriebus commissuralibus discontinuis; cellulae chlorophylliferae lenticulares, inclusae vel utroque latere folii parietibus incrassatis liberae.

Plants brown or yellow-brown, tumid, ca. 6 cm high. Stems simple, very slender, brown; epidermal cells often porose, 1–2-layered; wood cylinder brown or

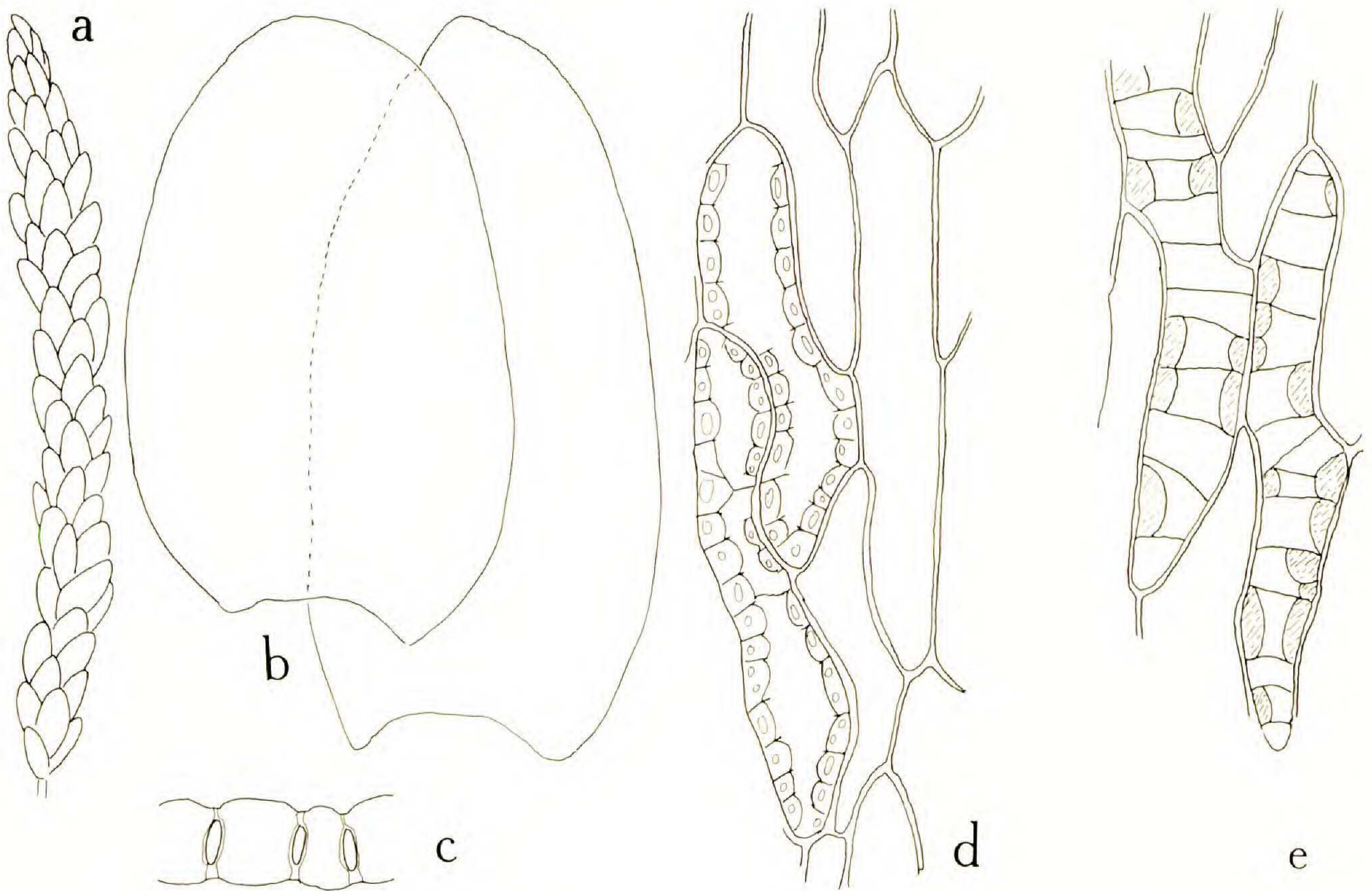


FIG 7. *Sphagnum rio-negrense*. a. Habit of plant, $\times 3$. b. Leaves, $\times 24$. c. Portion of leaf in section, $\times 390$. d. Upper cells of leaf, outer surface, $\times 390$. e. Upper cells of leaf, inner surface, $\times 390$.

red-brown. Stem leaves 2 mm long, ovate-elliptic, deeply concave; hyaline cells not divided, fibrillose on the inner surface but with fibril stumps on the outer, on the outer surface with small, ringed, rounded-elliptic pores crowded in commissural rows, on the inner surface with few scattered to rather numerous ringed pseudopores in discontinuous commissural rows; green cells lenticular, included or narrowly exposed on both surfaces by thickened end walls or more broadly exposed on the outer surface, the hyaline cells plane.

ADDITIONAL SPECIMEN EXAMINED. COLOMBIA. Cundinamarca: Páramo de Palacio, Lagunas de Butriago, 3350 m, 27 Apr 1973, A. Cleef 9580 (NY).

The stems are simple, and the plants have much the same appearance as the North American *Sphagnum cyclophyllum* Sull., which has much larger leaves with minute, rounded, well-spaced pores on the outer surface and only a few corner pores, or none at all, on the inner surface, and trapezoidal green cells that in section show a broader exposure on the inner surface.

***Sphagnum* [sect. *Subsecunda*] *subhomophyllum* Crum, sp. nov.**—TYPE: BRAZIL. Rio de Janeiro: Serra de Itatiaia bei Visconde de Mauá, Triefstelle an der Strasse nach Marombá, 1400 m, 17 Apr 1987, Schäfer-Verwimp & Verwimp 8323 (holotype: MICH!; isotype: Schäfer-Verwimp!). Fig. 8.

Plantae ca 7 cm altae, pallido-brunneae, superne aeneae. Caules brunnei; cellulae corticis unistratosae, sine poris; cylindrus lignosus brunneus. Folia caulina 1-2 mm longa, oblongo-triangularia, concavo-acuta; cellulae hyalinae dimidio superiore folii fibrillosae, non septatae, utroque superficie poris numerosis in seriebus commissuralibus discontinuis et superne apice etiam poris vel pseudoporis

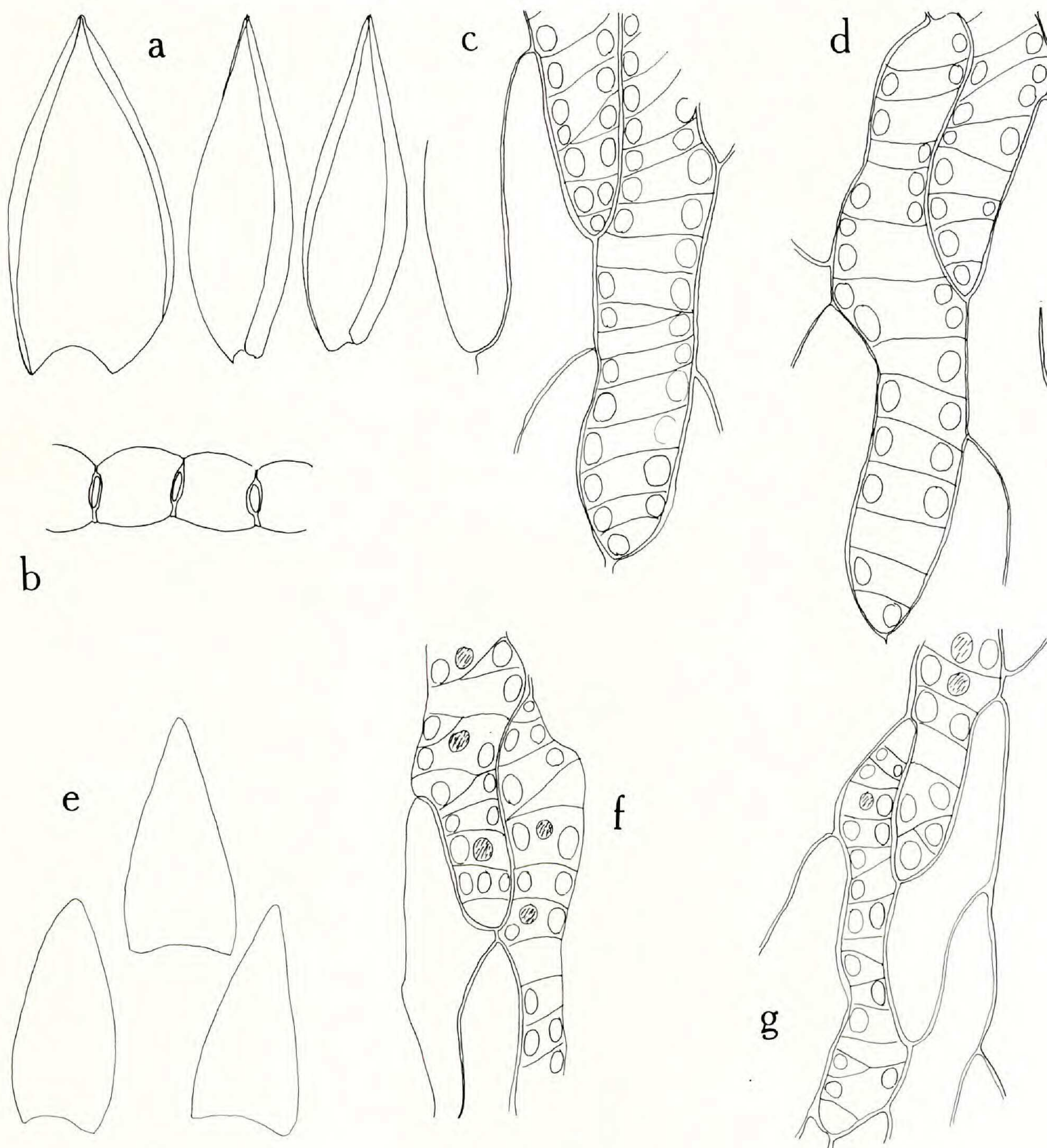


FIG. 8. *Sphagnum subhomophyllum*. a. Branch leaves, $\times 24$. b. Portion of branch leaf in section, $\times 390$. c. Upper cells of branch leaf, outer surface, $\times 390$. d. Upper cells of branch leaf, inner surface, $\times 390$. e. Stem leaves, $\times 24$. f. Upper cells of stem leaf, outer surface, $\times 390$. g. Upper cells of stem leaf, inner surface, $\times 390$.

in medio cellulae medio instructis. Fasciculi ramorum ramis tribus (1 pendenti). Folia ramulina 1.8–2 mm longa, oblongo-lanceolata; cellulae hyalinae dorso poris ellipticis in seriebus commissuralibus continuis, apice folii in medio cellularum poris 2–6 (–12), rotundis, superficie interiore poris in seriebus commissuralibus fere continuis; cellulae chlorophylliferae in sectione transversali ellipticae vel lenticulares, utroque latere peranguste liberae, praesertim superficie exteriori.

Plants up to 7 cm tall, pale brown, bronze above. Stems brown; cortex 1-layered, without pores; wood cylinder brown. Stem leaves 1–2 mm long, oblong-triangular, concave-acute; hyaline cells fibrillose in the upper half or two-thirds, undivided, on both surfaces with numerous rounded-elliptic pores in discontinuous commissural rows and near the apex 2–3 or more round pores or pseudopores in a median row. Branches in fascicles of 3 (2 spreading, 1 weak and pendent). Branch leaves 1.8–2 mm long, oblong-lanceolate; hyaline cells on the outer surface with

elliptic pores in continuous commissural rows and toward the apex 2–6, rarely 12 round, median pseudopores, on the inner surface with pores in nearly continuous commissural rows; green cells elliptic to lenticular, very narrowly exposed on one or both surfaces, especially the outer.

The species is interesting because of median pseudopores on the outer surfaces toward the apex of both stem and branch leaves and also on the inner surface quite near the apex of stem leaves. *Sphagnum homophyllum* Crum and *S. pluriporosum* Crum have median pores rather than pseudopores. In addition, *S. homophyllum* has shorter branch leaves with the commissural pores on the outer surface indistinctly partitioned off and green cells more exposed on both surfaces. *Sphagnum pluriporosum* also has shorter branch leaves and green cells central and included.

Sphagnum [Sect. *Subsecunda*] **sumapazense** Crum, sp. nov.—TYPE: COLOMBIA. Meta: Páramo de Sumapaz, Hoya de la Quebrada Sitiales, 2.5 km SW Laguna La Primavera, 3500 m, 26 Jan 1972, A. M. Cleef 1052 (holotype: MICH!; isotype: NY!). Fig. 9.

Plantae ca 10 cm altae, tumidae, subsimplices. Caules tenues, obscure fuscii; cellulae corticis stratis duobus, saepe uniporosae; cylindrus lignosus obscure fuscus. Folia caulina 2 mm longa, profunde concava, late ovata; cellulae hyalinae parce 1-septatae, fibrillis nullis vel tantum praesentibus, dorso poris annulatis in seriebus commissuralibus continuis, etiam 0–7 (–15) poris minutis, non annulatis in medio cellulae, superficie interiore poris et pseudoporis rotundis, annulatis, in seriebus commissuralibus continuis dispositis; cellulae chlorophylliferae in sectione transversali anguste orciformes, utroque superficie liberae propter crassitunicas.

Plants brown, tumid, nearly simple (the branches scarcely emergent beyond stem leaves), up to 10 cm high. Stems slender, dark brown; cortex in 2 layers, the cells often 1-porose; wood cylinder dark brown. Stem leaves 2 mm long, deeply concave, broadly ovate; hyaline cells not or rarely 1-divided, with fibrils reduced or lacking, on the outer surface with rounded-elliptic, ringed pores in continuous commissural rows and also with 0–7 (–15) minute, round, unringed pores in a median position, on the inner surface with ringed, rounded-elliptic pores and pseudopores in continuous commissural rows; green cells narrowly barrel-shaped, with central lumina, exposed on both surfaces by thickened cell ends, the hyaline cells plane on both surfaces.

ADDITIONAL SPECIMENS EXAMINED. COLOMBIA. Cundinamarca: Páramo de Sumapaz, Chisacá, Laguna N of Laguna Grande, 3650 m, 15 Nov 1971, A. M. Cleef & R. Jaramillo-M. 41, (MICH, NY).—Without locality: R. E. Schultes 11475 (MICH, NY, TENN).

The plants bear a considerable resemblance to *S. cyclophyllum* Sull. but have much smaller leaves with pores on the outer surface crowded in commissural rows and also well-spaced, small median pores of a variable number. In the type collection the median pores are rather consistently numerous, often as many as 11 or 15 per cell, but in the other collections they vary from one to seven or may even be absent. The hyaline cells of the stem leaves are virtually lacking in fibrils. *Sphagnum rio-negrense* Crum, also from Colombia, is rather similar, but its leaves have no median pores at all and fibrils on the inner surface.

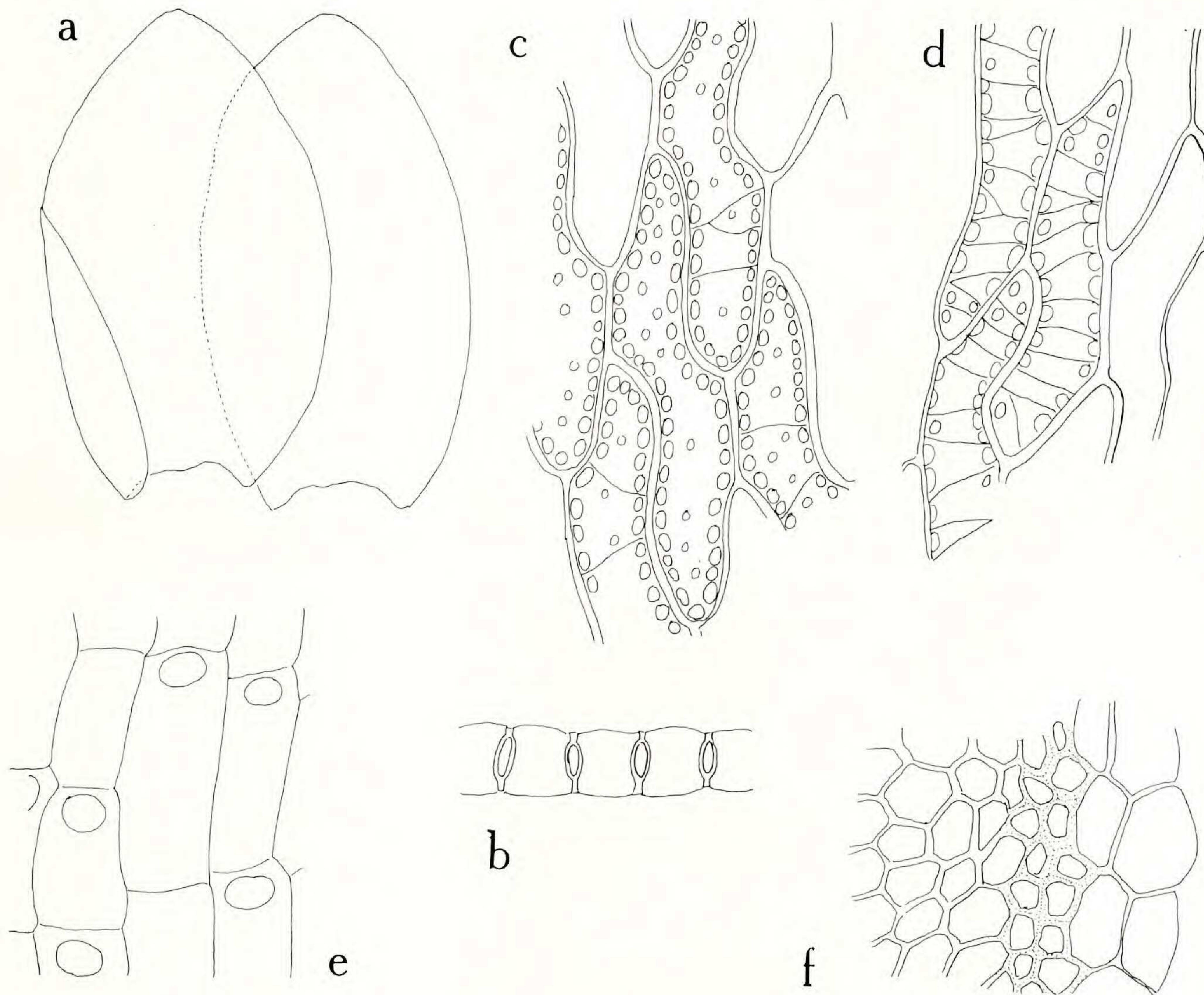


FIG. 9. *Sphagnum sumapazense*. a. Leaves, $\times 24$. b. Portion of stem in section, $\times 390$. c. Portion of leaf in section, $\times 390$. d. Upper cells of leaf, outer surface, $\times 390$. e. Cortical cells of stem, in surface view, $\times 390$. f. Portion of stem in section, $\times 390$.

ADDITIONAL NOTE

Sphagnum frahmii Crum, Contr. Univ. Michigan Herb. 20:130. 1995.—TYPE: BRAZIL. São Paulo: an der Küstenstrasse SP55 zwischen Peruipe und Itahaem, feuchter Restingawald und anschließende offene Sandflächen, ca. 5 m.s.m., 17 Jul 1977, J.-P. Frahm 1866, 1869, 1874 (holotype: MICH!; isotype: ALTA!).

I am indebted to Marshall Crosby for pointing out that this species was not validly published because the type was cited from both MICH and ALTA. The specimen in the Herbarium of the University of Michigan is hereby designated as the holotype.

LITERATURE CITED

- Crum, H. 1984. Sphagnopsida, Sphagnaceae. North Amer. Fl., ser. 2, pt. 11: 1–180.
 Yamaguchi, T., R. D. Seppelt, Z. Iwatsuki, and A. M. Buchanan. 1990. *Sphagnum* (sect. *Buchanania*) *leucobryoides* sect. et sp. nov. from Tasmania. J. Bryol. 6: 45–54.
 Yamaguchi, T., R. D. Seppelt, and Z. Iwatsuki. 1992. *Buchanania* (*Sphagnum*, Sphagnaceae) sect. nov. Hikobia 11: 139–140.